SEQUENCE LISTING

<110> Takeda Chemical Industries, Ltd.

<120> Betacellulin Mutein

<130> P2001-232

<140> US/09/857,815A
<141> 2001-06-08

<150> JP 10-350377
<151> 1998-12-09

<150> JP 11-55326
<151> 1999-03-03

<160> 64

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Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys
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65   70   75

<210> 2
<211> 76
<212> PRT
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            20   25   30
Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys
        35   40   45
Gly Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys Val Cys
    50   55   60
Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val
65   70   75

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<211> 47
<212> PRT
<213> Human

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Arg Lys Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys
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Val Cys Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Asp
        35   40   45

<210> 4
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<400> 4
Arg Lys Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys
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Ile Lys Gly Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys
            20   25   30
Val Cys Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val
        35   40   45

<210> 5
<211> 79
<212> PRT
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<220>
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Asp Gly Asn Ser Thr Arg Ser Pro Glu Thr Asn Gly Leu Leu Cys Gly
 1   5   10   15
Asp Pro Glu Glu Asn Cys Ala Ala Thr Thr Thr Gln Ser Lys Arg Lys
            20   25   30
Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys
        35   40   45
Gly Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys Val Cys
    50   55   60
Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Leu Phe Tyr
65   70   75

<210> 6
<211> 78
<212> PRT
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1 5 10 15
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20 25 30
Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys
35 40 45
Gly Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys Val Cys
50 55 60
Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Leu Phe
65 70 75

<210> 7
<211> 77
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1 5 10 15
Asp Pro Glu Glu Asn Cys Ala Ala Thr Thr Thr Gln Ser Lys Arg Lys
20 25 30
Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys
35 40 45
Gly Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys Val Cys
50 55 60
Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Leu
65 70 75

<210> 8
<211> 79
<212> PRT
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<220>
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1 5 10 15
Asp Pro Glu Glu Asn Cys Ala Ala Thr Thr Thr Gln Ser Lys Arg Lys
20 25 30
Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys
35 40 45
Gly Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys Val Cys
50 55 60

Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Asp Phe Tyr
65 70 75

<210> 9
<211> 78
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<220>
<223> amino acid sequence of betacellulin mutein (BTC 1-77, 80)

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1 5 10 15
Asp Pro Glu Glu Asn Cys Ala Ala Thr Thr Thr Gln Ser Lys Arg Lys
20 25 30
Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys
35 40 45
Gly Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys Val Cys
50 55 60
Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Asp Phe
65 70 75

<210> 10
<211> 49
<212> PRT
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<220>
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1 5 10 15
Ile Lys Gly Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys
20 25 30
Val Cys Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Leu Phe
35 40 45
Tyr

<210> 11
<211> 48
<212> PRT
<213> Artificial sequence

<220>
<223> amino acid sequence of betacellulin mutein (BTC 31-76, 78, 79)

<400> 11
Arg Lys Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys
1 5 10 15
Ile Lys Gly Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys

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            20                  25                  30
Val Cys Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Leu Phe
        35                  40                  45

<210> 12
<211> 47
<212> PRT
<213> Artificial sequence

<220>
<223> amino acid sequence of betacellulin mutein (BTC 31-76, 78)

<400> 12
Arg Lys Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys
 1               5                  10                  15
Ile Lys Gly Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys
            20                  25                  30
Val Cys Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Leu
        35                  40                  45

<210> 13
<211> 49
<212> PRT
<213> Artificial sequence

<220>
<223> amino acid sequence of betacellulin mutein (BTC 31-77, 79, 80)

<400> 13
Arg Lys Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys
 1               5                  10                  15
Ile Lys Gly Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys
            20                  25                  30
Val Cys Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Asp Phe
        35                  40                  45
Tyr

<210> 14
<211> 48
<212> PRT
<213> Artificial sequence

<220>
<223> amino acid sequence of betacellulin mutein (BTC 31-77, 79)

<400> 14
Arg Lys Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys
 1               5                  10                  15
Ile Lys Gly Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys
            20                  25                  30
Val Cys Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Asp Phe
        35                  40                  45
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<210> 15
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<212> DNA
<213> Human

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aactgtgcag ctaccaccac acaatcaaag cggaaaggcc acttctctag gtgccccaag 120
caatacaagc attactgcat caaagggaga tgccgcttcg tggtggccga gcagacgccc 180
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<210> 16
<211> 228
<212> DNA
<213> Human

<400> 16
gatgggaatt ccaccagaag tcctgaaact aatggcctcc tctgtggaga ccctgaggaa 60
aactgtgcag ctaccaccac acaatcaaag cggaaaggcc acttctctag gtgccccaag 120
caatacaagc attactgcat caaagggaga tgccgcttcg tggtggccga gcagacgccc 180
tcctgtgtct gtgatgaagg ctacattgga gcaaggtgtg agagagtt 228

<210> 17
<211> 141
<212> DNA
<213> Human

<400> 17
cggaaaggcc acttctctag gtgccccaag caatacaagc attactgcat caaagggaga 60
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gcaaggtgtg agagagttga c 141

<210> 18
<211> 138
<212> DNA
<213> Human

<400> 18
cggaaaggcc acttctctag gtgccccaag caatacaagc attactgcat caaagggaga 60
tgccgcttcg tggtggccga gcagacgccc tcctgtgtct gtgatgaagg ctacattgga 120
gcaaggtgtg agagagtt 138

<210> 19
<211> 237
<212> DNA
<213> Artificial sequence

<220>
<223> base sequence of cDNA encoding betacellulin mutein represented by SEQ ID NO: 5

<400> 19
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aactgtgcag ctaccaccac acaatcaaag cggaaaggcc acttctctag gtgccccaag 120
caatacaagc attactgcat caaagggaga tgccgcttcg tggtggccga gcagacgccc 180
tcctgtgtct gtgatgaagg ctacattgga gcaaggtgtg agagagtttt gttttac 237

<210> 20
<211> 234
<212> DNA
<213> Artificial sequence

<220>
<223> base sequence of cDNA encoding betacellulin mutein represented by SEQ ID NO: 6

<400> 20
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aactgtgcag ctaccaccac acaatcaaag cggaaaggcc acttctctag gtgccccaag 120
caatacaagc attactgcat caaagggaga tgccgcttcg tggtggccga gcagacgccc 180
tcctgtgtct gtgatgaagg ctacattgga gcaaggtgtg agagagtttt gttt 234

<210> 21
<211> 231
<212> DNA
<213> Artificial sequence

<220>
<223> base sequence of cDNA encoding betacellulin mutein represented by SEQ ID NO: 7

<400> 21
gatgggaatt ccaccagaag tcctgaaact aatggcctcc tctgtggaga ccctgaggaa 60
aactgtgcag ctaccaccac acaatcaaag cggaaaggcc acttctctag gtgccccaag 120
caatacaagc attactgcat caaagggaga tgccgcttcg tggtggccga gcagacgccc 180
tcctgtgtct gtgatgaagg ctacattgga gcaaggtgtg agagagtttt g 231

<210> 22
<211> 237
<212> DNA
<213> Artificial sequence

<220>
<223> base sequence of cDNA encoding betacellulin mutein represented by SEQ ID NO: 8

<400> 22
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aactgtgcag ctaccaccac acaatcaaag cggaaaggcc acttctctag gtgccccaag 120
caatacaagc attactgcat caaagggaga tgccgcttcg tggtggccga gcagacgccc 180
tcctgtgtct gtgatgaagg ctacattgga gcaaggttga cttttac 237

<210> 23

<211> 234
<212> DNA
<213> Artificial sequence

<220>
<223> base sequence of cDNA encoding betacellulin mutein represented by SEQ ID NO: 9

<400> 23
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aactgtgcag ctaccaccac acaatcaaag cggaaaggcc acttctctag gtgccccaag 120
caatacaagc attactgcat caaagggaga tgccgcttcg tggtggccga gcagacgccc 180
tcctgtgtct gtgatgaagg ctacattgga gcaaggtgtg agagagttga cttt 234

<210> 24
<211> 147
<212> DNA
<213> Artificial sequence

<220>
<223> base sequence of cDNA encoding betacellulin mutein represented by SEQ ID NO: 10

<400> 24
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tgccgcttcg tggtggccga gcagacgccc tcctgtgtct gtgatgaagg ctacattgga 120
gcaaggtgtg agagagtttt gttttac 147

<210> 25
<211> 144
<212> DNA
<213> Artificial sequence

<220>
<223> base sequence of cDNA encoding betacellulin mutein represented by SEQ ID NO: 11

<400> 25
cggaaaggcc acttctctag gtgccccaag caatacaagc attactgcat caaagggaga 60
tgccgcttcg tggtggccga gcagacgccc tcctgtgtct gtgatgaagg ctacattgga 120
gcaaggtgtg agagagtttt gttt 144

<210> 26
<211> 141
<212> DNA
<213> Artificial sequence

<220>
<223> base sequence of cDNA encoding betacellulin mutein represented by SEQ ID NO: 12

<400> 26

cggaaaggcc acttctctag gtgccccaag caatacaagc attactgcat caaagggaga 60
tgccgcttcg tggtggccga gcagacgccc tcctgtgtct gtgatgaagg ctacattgga 120
gcaaggtgtg agagagtttt g 141

<210> 27
<211> 147
<212> DNA
<213> Artificial sequence

<220>
<223> base sequence of cDNA encoding betacellulin mutein represented by S
EQ ID NO: 13

<400> 27
cggaaaggcc acttctctag gtgccccaag caatacaagc attactgcat caaagggaga 60
tgccgcttcg tggtggccga gcagacgccc tcctgtgtct gtgatgaagg ctacattgga 120
gcaaggtgtg agagagttga cttttac 147

<210> 28
<211> 144
<212> DNA
<213> Artificial sequence

<220>
<223> base sequence of cDNA encoding betacellulin mutein represented by S
EQ ID NO: 14

<400> 28
cggaaaggcc acttctctag gtgccccaag caatacaagc attactgcat caaagggaga 60
tgccgcttcg tggtggccga gcagacgccc tcctgtgtct gtgatgaagg ctacattgga 120
gcaaggtgtg agagagttga cttt 144

<210> 29
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer 1

<400> 29
catatggatg ggaattccac cagaagtcct g 31

<210> 30
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer 2

<400> 30

ggatccctag tcaactctct cacaccttgc tcc 33

<210> 31
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer RI-1

<400> 31
agagtcaagg atcccccaac cact 24

<210> 32
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer RI-3

<400> 32
agctggtcac ttagggctgg gg 22

<210> 33
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer RI-1Cla

<400> 33
gaatcgatag agtcaaggat ccccca 26

<210> 34
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer RI-3Xho

<400> 34
gactcgagct ggtcacttag gg 22

<210> 35
<211> 80
<212> PRT
<213> Human

<400> 35

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1               5                  10                  15
Asp Pro Glu Glu Asn Cys Ala Ala Thr Thr Thr Gln Ser Lys Arg Lys
            20                  25                  30
Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys
        35                  40                  45
Gly Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys Val Cys
    50                  55                  60
Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Asp Leu Phe Tyr
65                  70                  75                  80
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<210> 36
<211> 240
<212> DNA
<213> Human

<400> 36
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aactgtgcag ctaccaccac acaatcaaag cggaaaggcc acttctctag gtgccccaag 120
caatacaagc attactgcat caaagggaga tgccgcttcg tggtggccga gcagacgccc 180
tcctgtgtct gtgatgaagg ctacattgga gcaaggtgtg agagagttga cttgttttac 240

<210> 37
<211> 75
<212> PRT
<213> Human

<400> 37
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Gly Asn Ser Thr Arg Ser Pro Glu Thr Asn Gly Leu Leu Cys Gly Asp
 1               5                  10                  15
Pro Glu Glu Asn Cys Ala Ala Thr Thr Thr Gln Ser Lys Arg Lys Gly
            20                  25                  30
His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys Gly
        35                  40                  45
Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys Val Cys Asp
    50                  55                  60
Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val
65                  70                  75
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<210> 38
<211> 53
<212> PRT
<213> Human

<400> 38
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Ala Thr Thr Thr Gln Ser Lys Arg Lys Gly His Phe Ser Arg Cys Pro
 1               5                  10                  15
Lys Gln Tyr Lys His Tyr Cys Ile Lys Gly Arg Cys Arg Phe Val Val
            20                  25                  30
Ala Glu Gln Thr Pro Ser Cys Val Cys Asp Glu Gly Tyr Ile Gly Ala
        35                  40                  45
Arg Cys Glu Arg Val
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50 53

<210> 39
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer 3

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<210> 40
<211> 34
<212> DNA
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<220>
<223> Primer 4

<400> 40
ggatccctaa actctctcac accttgctcc aatg 34

<210> 41
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer 5

<400> 41
cagcatatgg ctaccaccac acaatcaaag 30

<210> 42
<211> 225
<212> DNA
<213> Human

<400> 42
gggaattcca ccagaagtcc tgaaactaat ggcctcctct gtggagaccc tgaggaaaac 60
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tacaagcatt actgcatcaa agggagatgc cgcttcgtgg tggccgagca gacgccctcc 180
tgtgtctgtg atgaaggcta cattggagca aggtgtgaga gagtt 225

<210> 43
<211> 159
<212> DNA
<213> Human

<400> 43

cctaccacca cacaatcaaa ccccaaaccc cacttctcta cctcccccaa ccaatacaac 60
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tctcatcaac cctacattcc accaaccctct cacacactt 159

<210> 44
<211> 53
<212> PRT
<213> Artificial sequence

<220>
<223> amino acid sequence of betacwelluin mutein (BTC 31-58, Asn, Pro, Se
r, 59-80)

<400> 44
Arg Lys Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys
1 5 10 15
Ile Lys Gly Arg Cys Arg Phe Val Val Ala Glu Gln Asn Pro Ser Thr
20 25 30
Pro Ser Cys Val Cys Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg
35 40 45
Val Asp Leu Phe Tyr
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<210> 45
<211> 48
<212> PRT
<213> Artificial sequence

<220>
<223> amino acid sequence of betacwelluin mutein (Asn, Ser, Asp, Ser, Glu
, BTC38-80)

<400> 45
Asn Ser Asp Ser Glu Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys
1 5 10 15
Gly Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys Val Cys
20 25 30
Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Asp Leu Phe Tyr
35 40 45

<210> 46
<211> 83
<212> PRT
<213> Artificial sequence

<220>
<223> amino acid sequence of betacwelluin mutein (BTC 1-58, Asn, Pro, Ser
, 59-80)

<400> 46
Asp Gly Asn Ser Thr Arg Ser Pro Glu Thr Asn Gly Leu Leu Cys Gly
1 5 10 15

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Asp Pro Glu Glu Asn Cys Ala Ala Thr Thr Thr Gln Ser Lys Arg Lys
            20                  25                  30
Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys
        35                  40                  45
Gly Arg Cys Arg Phe Val Val Ala Glu Gln Asn Pro Ser Thr Pro Ser
    50                  55                  60
Cys Val Cys Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Asp
65                  70                  75                  80
Leu Phe Tyr
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<210> 47
<211> 249
<212> DNA
<213> Artificial sequence

<220>
<223> base sequence of cDNA encoding betacellulin mutein represented by SEQ ID NO: 46

<400> 47
gatgggaatt ccaccagaag tcctgaaact aatggcctcc tctgtggaga ccctgaggaa 60
aactgtgcag ctaccaccac acaatcaaag cggaaaggcc acttctctag gtgccccaag 120
caatacaagc attactgcat caaagggaga tgccgcttcg tggtggccga gcagaacccc 180
tcgacgccct cctgtgtctg tgatgaaggc tacattggag caaggtgtga gagagttgac 240
ttgttttac 249

<210> 48
<211> 159
<212> DNA
<213> Artificial sequence

<220>
<223> base sequence of cDNA encoding betacellulin mutein represented by SEQ ID NO: 44

<400> 48
cggaaaggcc acttctctag gtgccccaag caatacaagc attactgcat caaagggaga 60
tgccgcttcg tggtggccga gcagaacccc tcgacgccct cctgtgtctg tgatgaaggc 120
tacattggag caaggtgtga gagagttgac ttgttttac 159

<210> 49
<211> 144
<212> DNA
<213> Artificial sequence

<220>
<223> base sequence of cDNA encoding betacellulin mutein represented by SEQ ID NO: 45

<400> 49
aacagcgact ctgagtgccc caagcaatac aagcattact gcatcaaagg gagatgccgc 60
ttcgtggtgg ccgagcagac gccctcctgt gtctgtgatg aaggctacat tggagcaagg 120

tgtgagagag ttgacttgtt ttac 144

<210> 50
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer BT-95h

<400> 50
agcatatgcg gaaaggccac ttctctaggt 30

<210> 51
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer BT-94h

<400> 51
ctggatccta gtaaaacaag tcaactctct 30

<210> 52
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer PET-1

<400> 52
gaaataattt tgtttaactt taagaaggag 30

<210> 53
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer BTC-1

<400> 53
aggagggcgt cgaggggttc tgctcggcca 30

<210> 54
<211> 30
<212> DNA
<213> Artificial Sequence

<220>

<223> Primer BTC-2

<400> 54
tggccgagca gaacccctcg acgccctcct 30

<210> 55
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer BTC-3

<400> 55
tctatgcgca cccgttctcg gagcactgtc 30

<210> 56
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer BTC-7

<400> 56
tatacatatg aacagcgact ctgagtgccc caagc 35

<210> 57
<211> 40
<212> PRT
<213> Human

<400> 57
Asp Gly Asn Ser Thr Arg Ser Pro Glu Thr Asn Gly Leu Leu Cys Gly
1 5 10 15
Asp Pro Glu Glu Asn Cys Ala Ala Thr Thr Thr Gln Ser Lys Arg Lys
20 25 30
Gly His Phe Ser Arg Cys Pro Lys
35 40

<210> 58
<211> 36
<212> PRT
<213> Human

<400> 58
Gln Tyr Lys His Tyr Cys Ile Lys Gly Arg Cys Arg Phe Val Val Ala
1 5 10 15
Glu Gln Thr Pro Ser Cys Val Cys Asp Glu Gly Tyr Ile Gly Ala Arg
20 25 30
Cys Glu Arg Val
35

<210> 59
<211> 37
<212> PRT
<213> Human

<400> 59
Asp Gly Asn Ser Thr Arg Ser Pro Glu Thr Asn Gly Leu Leu Cys Gly
1 5 10 15
Asp Pro Glu Glu Asn Cys Ala Ala Thr Thr Thr Gln Ser Lys Arg Lys
20 25 30
Gly His Phe Ser Arg
35

<210> 60
<211> 39
<212> PRT
<213> Human

<400> 60
Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys Gly Arg Cys Arg Phe
1 5 10 15
Val Val Ala Glu Gln Thr Pro Ser Cys Val Cys Asp Glu Gly Tyr Ile
20 25 30
Gly Ala Arg Cys Glu Arg Val
35

<210> 61
<211> 75
<212> PRT
<213> Human

<400> 61
Gly Asn Ser Thr Arg Ser Pro Glu Thr Asn Gly Leu Leu Cys Gly Asp
1 5 10 15
Pro Glu Glu Asn Cys Ala Ala Thr Thr Thr Gln Ser Lys Arg Lys Gly
20 25 30
His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys Gly
35 40 45
Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys Val Cys Asp
50 55 60
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